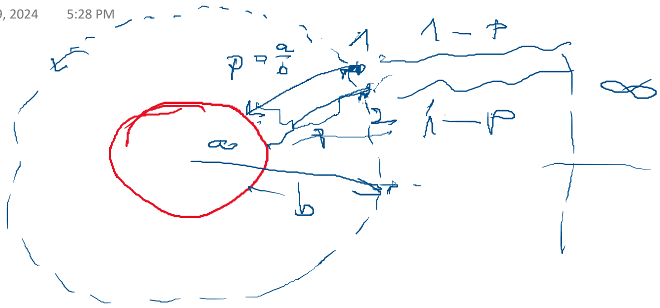
Erik 2024-07-19

Friday, July 19, 2024 5:28 PM



$$P(a|b) = \frac{a}{b}$$

$$P(0) = (1-p)$$

$$P(1) = p(1-p)$$

$$P(2) = p^2(1-p)$$

$$\langle n \rangle = \sum_{n=0}^{\infty} n\, P(n) = \sum_{n=0}^{\infty} n\, p^n (1-p)$$

$$= (1-p) \sum_{n=0}^{\infty} n\, p^n =$$

$$= (1-p)\left[p + 2p^2 + 3p^3 + \dots\right] =$$

$$= p(1-p)\left[1 + 2p + 3p^2 + \dots\right] =$$

$$\frac{d}{dp}\Big(\underbrace{1 + p + p^2 + p^3 \dots}_{\frac{1}{1-p}}\Big) = 1 + 2p + 3p^2 + \dots$$

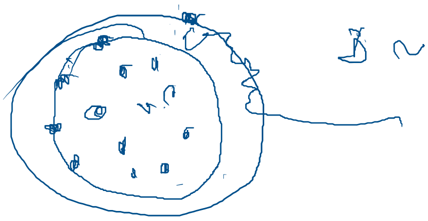
$$\frac{d}{dp}\left(\frac{1}{1-p}\right) = -\frac{1}{(1-p)^2}\underbrace{(1-p)'}_{=-1} =$$

$$= \frac{1}{(1-p)^2}$$

$$\langle n \rangle = p(1-p) \cdot \frac{1}{(1-p)^2} = \frac{p}{1-p}$$

$$= \frac{\frac{a}{b}}{1-\frac{a}{b}} = \underline{\frac{a}{b-a}}$$

$b \sim a$



a, b, c $P(a \text{ a nie } c) = \frac{a}{b} \cdot \frac{c-b}{c-a}$

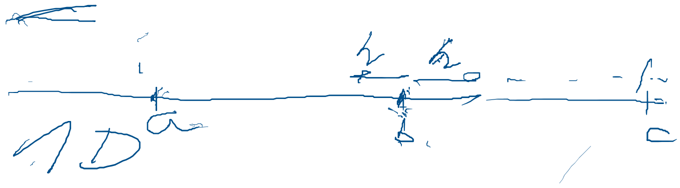
$P_{ab} - P_{ac} = \frac{a}{b} - \frac{a}{b} \cdot \frac{c-b}{c-a} =$

$= \frac{a}{b}\left(\frac{b-a}{c-a}\right)$

$b = 2a$

$c = 3a$

$P(c \text{ pred } a) = \frac{1}{2} \frac{a}{2a} = \frac{1}{4}$



$\frac{\partial^2 c}{\partial x^2} = 0$

a	b	c
0	c_0	0

$c(x) = u + v x$

$a < x < b$

$c(a) = 0, \quad c(b) = c_0$

$u + va = 0 \qquad u = -va$

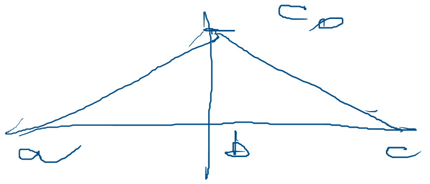
$u + vb = c_0 \qquad v(b-a) = c_0 \qquad v = \frac{c_0}{b-a}$

$u = -\frac{c_0 a}{b-a}$

$c(x) = c_0\left(\frac{x-a}{b-a}\right)$

$$b < x < c$$

$$c(x) = c_0 \left(\frac{c - x}{c - b} \right)$$



$$J_a = -D \frac{d}{dx}\left(\frac{x-a}{b-a} \right) = -D \frac{1}{b-a} =$$

$$= - \frac{D}{b-a}$$

$$J_c = -D \frac{d}{dx}\left(\frac{c-x}{c-b} \right) = + \frac{D}{c-b}$$

$$P(a \text{ pred } c) = \frac{|J_a|}{|J_a| + |J_c|} =$$

$$= \frac{\frac{D}{b-a}}{\frac{D}{b-a} + \frac{D}{c-b}} = \frac{1}{1 + \frac{b-a}{c-b}} =$$

$$= \frac{c-b}{c-a} \longrightarrow 1, \text{ keď } c \to \infty$$

D.Ú.

Mali sme situáciu v 3D

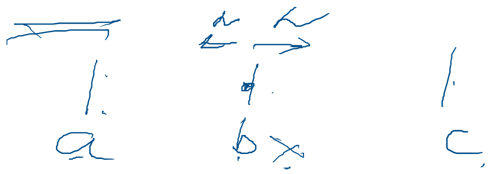
$P(b, a \text{ pred } \infty) = \frac{a}{b}$

a v 1D:

$P(b, a \text{ pred } \infty) = 1.$

Ako to je v 2D?

$\boxed{\text{Stredný čas záchytu}}$



Kroky o veľkosti h s frekvenciou τ.

Aký je stredný čas záchytu v a?

Aký je stredný čas záchytu v a?

$W(x)$ stredný čas do záchytu

$W(x-h)\quad W(x)\quad W(x+h)$

$x-h\quad x\quad x+h$

$$W(x) = \tau + \frac{1}{2}W(x-h) + \frac{1}{2}W(x+h)$$

$$-\frac{1}{2}\left[W(x-h) - 2W(x) + W(x+h)\right] = \tau$$

$$-\frac{1}{2}\left[W(x-h) - W(x) - \left(W(x) - W(x+h)\right)\right] = \tau$$

$$-\frac{1}{2}\left[\frac{W(x-h) - W(x)}{h} - \frac{W(x) - W(x+h)}{h}\right] = \frac{\tau}{h}$$

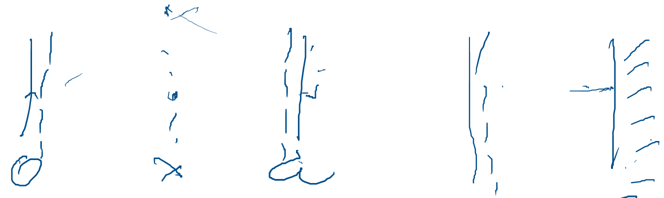
$h \to 0$

$$-\frac{1}{2}\left[\left.\frac{dW}{dx}\right|_{x-h} - \left.\frac{dW}{dx}\right|_{x}\right] = \frac{\tau}{h}$$

$$\boxed{\frac{2\tau}{h^2}} + \frac{d^2W}{dx} = 0$$

$1/D$

$$\boxed{\frac{d^2W}{dx^2} + \frac{1}{D} = 0}$$



$W=0$ $\quad$ $W>0$ $\quad$ $\frac{\partial W}{\partial x} = 0$